APPENDIX D

A NATURAL GAS PRIMER: THE COMPONENTS OF THE NATURAL GAS DELIVERY SYSTEM

Prepared by The American Gas Association (AGA)

From Wellhead to Burner Tip

The United States has about 1.2 million miles of natural gas pipeline, not including the individual service lines that run into homes and businesses. The following photos show the natural gas delivery system from the wellhead, where natural gas is extracted, to the burner tip, or end-use energy form.

Gas flowing from higher to lower pressure is the fundamental principle of the natural gas delivery system.

Natural pressure brings natural gas to the top of the well, where it goes into gathering lines.

Some gathering lines deliver natural gas to a processing plant, where impurities such as water or carbon dioxide are removed.

Most major pipelines are "looped" -- two or more lines run parallel to each other in the same right-of-way. The pipeline rights-of-way are typically 100 feet wide, with restrictions on construction activities.

Most major pipelines are "looped" -- two or more lines run parallel to each other in the same right-of-way. The pipeline rights-of-way are typically 100 feet wide, with restrictions on construction activities.

Compressor stations are located every 50 to 60 miles along each pipeline. A compressor is an internal combustion engine or turbine that creates pressure to "push" the gas through the lines. Many compressor stations are operated from a pipeline's central control room.

Along the pipeline route, depleted oil and gas wells, salt caverns and other natural geological formations are used to store gas for use during peak periods.

Pipelines interconnect with other pipelines and other utility systems, offering system operators flexibility in moving gas.

When the natural gas reaches a local gas utility, it passes through a gate station, where its pressure is reduced to a range between 100 pounds and as low as 1/4 pound. An odorant is added, and the volumes of gas are measured.

The natural gas then moves into distribution lines, or "mains," that range from 2 inches to 24 inches in diameter. Sections of the distribution system operate at different pressures, with regulators controlling the flow. Generally, the closer natural gas gets to a customer, the smaller the pipe and the lower the pressure.

The gas utility continuously monitors flow rates and pressures throughout its system at its central control center.

When the natural gas reaches a typical home, its service line is one inch or less in diameter, and its pressure is between 60 pounds and 1/4 pound.